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ABSTRACT

To investigate similarity judgements in different cultural contexts, the performance of two groups of children on seven similarity tasks and on two tests of metaphor was compared. The 45 Canadian and 45 Canadian-Greek children (ages 5, 8, and 11) had different cultural and linguistic backgrounds but common schooling experiences. The seven tasks were based on a model of similarity thinking focusing on the child's ability to plan and self-correct across the following seven hierarchically-related and developmentally-determined types of thinking: grouping objects on the basis of similarity relationships between elements; equivalence matching across similarity relationships; joining elements into extended strings in which parts organize similar parts; using rules to organize prior knowledge so that the product begins to order parts; planning with task goals to determine how parts can be organized or structured; using task goals innovatively so as to use rules in different ways at the service of the goals; and using the synergy principle. The Proverbs Test (a verbal metaphor test), the Metaphoric Triads Task (a pictorial metaphor test), and the Ravens Colored Progressive Matrices Test were administered. The results showed that the only significant difference was that the Canadian-Greek children performed better on the verbal metaphorical test, which may mean that these children's exposure to cultural proverbs enhanced their abstract recognition skills. The results are discussed with respect to developmental theory, bilingualism, and cross-cultural generalizability of cognitive constructs. (DST)

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A Cross-Cultural Study of the Development of Children's Similarity Judgements

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A better understanding of the general processes involved children's reasoning was determined by conducting comparative research with children from two different cultural backgrounds.

In order to investigate similarity judgements in different cultural contexts, two groups of children who were from different cultural and linguistic backgrounds but who had common schooling experiences were compared on their performance on similarity tasks and on two tests of metaphor. The Ravens Coloured Progressive Matrices Test was also administered to examine how performance on a standardized nonverbal intelligence test compares with the performance on these tasks.

The tasks were based on a model of similarity. The model of similarity focusses on the child's ability to plan and self-correct across seven types of thinking that are hierarchically related and are determined by developmental factors. Considerable emphasis is given to describing how children make similarity judgements since judgements of similarity make it possible for children (and adults) to apply old learning to new situations.

The results of the study showed that the only significant difference between the two cultural groups was that the Canadian-Greek children performed better on the verbal metaphorical test than the Canadian children. The results of the study are discussed with respect to developmental theory, bilingualism, and cross-cultural generalizeability of cognitive constructs.

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Introduction and Aim of Research

It has been stated (Campione, Brown and Ferrara, 1982) that comparative research with different populations, including retarded and learning disabled children is necessary to complete our theories of intelligence. Similarly, a better understanding of the general processes involved in children's reasoning can be determined by comparing task performances of children from different ethnic backgrounds.

This study compared the performance of Canadian and Canadian-Greek children on 7 similarity tasks in order to gain a better understanding of the development of similarity reasoning and to lay the groundwork for future research on the development of an assessment based on this type of reasoning.

The seven tasks were based on a model of similarity thinking developed by Gamlin (1979,1980). Each of the seven 'types' of thinking skills describe the emergence of a particular aspect of the similarity reasoning process. Gamlin claims that this development is hierarchical, with each type of thinking being built upon the previous ones. The seven types of thinking are: grouping objects into collections on the basis of similarity relationships between elements (type 1), equivalence matching across these similarity relationships (type 2), joining elements into extended strings in which parts organize similar parts (type 3), using rules to organize prior knowledge in such a way that the product begins to order parts (type 4), using task goals to plan so as to determine how parts can be organized or structured (type 5), innovating in the use of task goals so as to use old

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rules in different ways at the service of the goals (type 6), using the synergy principle (metaphorical reasoning and intentional use of the knowledge that the whole is more than the sum of the parts) (type 7). The use of the model is important in that judgements of similarity make it possible for children to apply old learning to new situations.

PROCEDURE

Seven manipulative tasks designed by Gamlin to assess similarity reasoning as well as the Ravens Coloured Progressive Matrices Test were given to forty-five Canadian Children and forty-five Canadian-Greek children (ages 5, 8 and 11) in Toronto, Canada. The Proverbs Test (a verbal metaphor test) and the Metaphoric Triads Task (a pictorial metaphor test) were also given to both groups, but only to the 8 and 11 year olds. When necessary prompts were given. Prompts consisted of: 1) repeating the instructions when the child failed to respond correctly, 2) pointing out a mistake and asking the child if he was sure "this is correct", or if "this piece goes there?" in a puzzle type task. No more than 5 prompts per task were given. These were recorded. The following data then was collected:

1. Number of subtasks completed correctly within each of the seven types of thinking.
2. Number of correctly completed components of each subtask (that is, for tasks that were not completed).
3. Number of prompts given to the child by the investigator for each task.
4. Number of spontaneously correct responses to the subtasks

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SCORING PROCEDURE

The scoring procedure used was a (0,1,2) scale, where 2 indicated completion of 75 to 100 per cent of the subtask, a 1 indicated 50 to 75 per cent of the subtask and a 0 indicated less than 50 percent of the subtask completed. This was the scoring procedure developed in the pilot study (Bountrogianni, 1980).

SUBJECTS

(1) Canadian children: This group was comprised of forty-five 5, 8 and 11 year olds who were born in Canada, whose first language was English and who attended public schools in Toronto, Canada. The parents of these children were born in Canada. Their fathers had professional or white collar occupations (eg. teachers, self-employed businessmen). There were fifteen children in each age group.

(2) Canadian-Greek children: This group was comprised of forty-five 5, 8 and 11 year old children, who were born in Canada, whose first language was Greek, whose parents were born in Greece and have emigrated to Canada, and whose fathers have professional or white collar occupations (teachers, self-employed businessmen). While the children attended public schools in Toronto, they also attended private Greek classes three times a week at a Greek school in Toronto. There were fifteen children in each age group.

RESULTS

The use of nonparametric techniques as opposed to parametric procedures was used since the tasks do not form an interval or ratio scale but an ordinal one. Spearman rank correlations, Mann-Whitney U tests, Kruskal-Wallis one way analysis of variance were used to analyze the data.

Reliability and Validity Data:

1. In summary, evidence was shown that the seven types of similarity thinking represented by the tasks form a cumulative scale and are determined by developmental factors. It was also shown that the tasks readily elicit the child's competence and therefore these tasks when further developed may be useful for assessing learning potential.

2. The scores on the set of manipulative tasks correlated significantly with the scores on the 3 criterion measures, the Ravens Matrices Test (RCPMT), the Metaphoric Triads Task or MTT (pictorial test of metaphor) and the Proverbs Test (verbal test of metaphor). Scores on each of the seven tasks were related to the scores on the Ravens whereas only types 6 and 7 task scores were related to the MTT scores. This gives evidence for the claim that the first five types of similarity reasoning are different than types 6 and 7, and that progression through the seven types of thinking is related to metaphorical thinking.

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Cross-Cultural Comparisons

There were not any significant differences as a function of cultural background for manipulative task performance and for performance on the Ravens CPMT and the MTT. The Canadian-Greek children were given more prompts but these prompts did not lead to significant differences between the two groups on task scores. That is, the prompts were given for the tasks that were not completed successfully.

The only significant difference between the two groups was that the Canadian-Greek children preferred the correct general meanings of the paraphrase in the Proverbs Test to a greater extent than did the Canadian children.

CONCLUSIONS

These results can be interpreted to mean that the Canadian-Greek children's exposure to proverbs in their culture enhanced their abstract recognition skills when working with proverbs. Each culture demands, fosters and rewards a somewhat different set of cognitive skills (Anastasi, 1983). Proverbs are used widely in Greece. Metaphorical expression is very popular and is used extensively in the Greek language, folklore and music. Given that the Greeks in Toronto have retained their ethnic identity in the form of traditions and values of the homeland and that one of these values is language (or the mother tongue), it could be that the Canadian-Greek children were developmentally 'ready' to benefit from their exposure to proverbs. That is, they were able to practice their verbal metaphorical thinking skills.

It is possible given the same type of exposure to proverbs,

the Canadian children would have performed comparably. That this difference between the two groups was a function of cultural background rather than a function of differential cognitive skills is supported in the data for the Metaphoric Triads Task, since the two groups showed similar performance. Furthermore, the developers of the MTT (Kogan et al., 1980) found significant correlations between the MTT and a set of verbal metaphorical triads and suggested that this was evidence for "general metaphorical style" across verbal and visual domains.

Another factor which may have contributed to the difference in the performance between the two groups, other than exposure to proverbs, may be linguistic. It has been stated by Cummins (1980) that bilingual children may be more adept at certain aspects of linguistic processing. In gaining control over two language systems, the bilingual child has had to decipher much more language input than the unilingual child.

That there were no other significant differences between the two groups (that is, on the RCPMT and MTT) in this study can be explained as follows: Both these groups were exposed to common schooling which foster the same basic thinking skills. Anastasi (1983) has stated that there is evidence that formal schooling may play an important part in encouraging abstract thinking and concept formation in Western-type schools. The blurring of cultural differences will occur in studies of minority samples attending the same school system in the U.S. and Canada.

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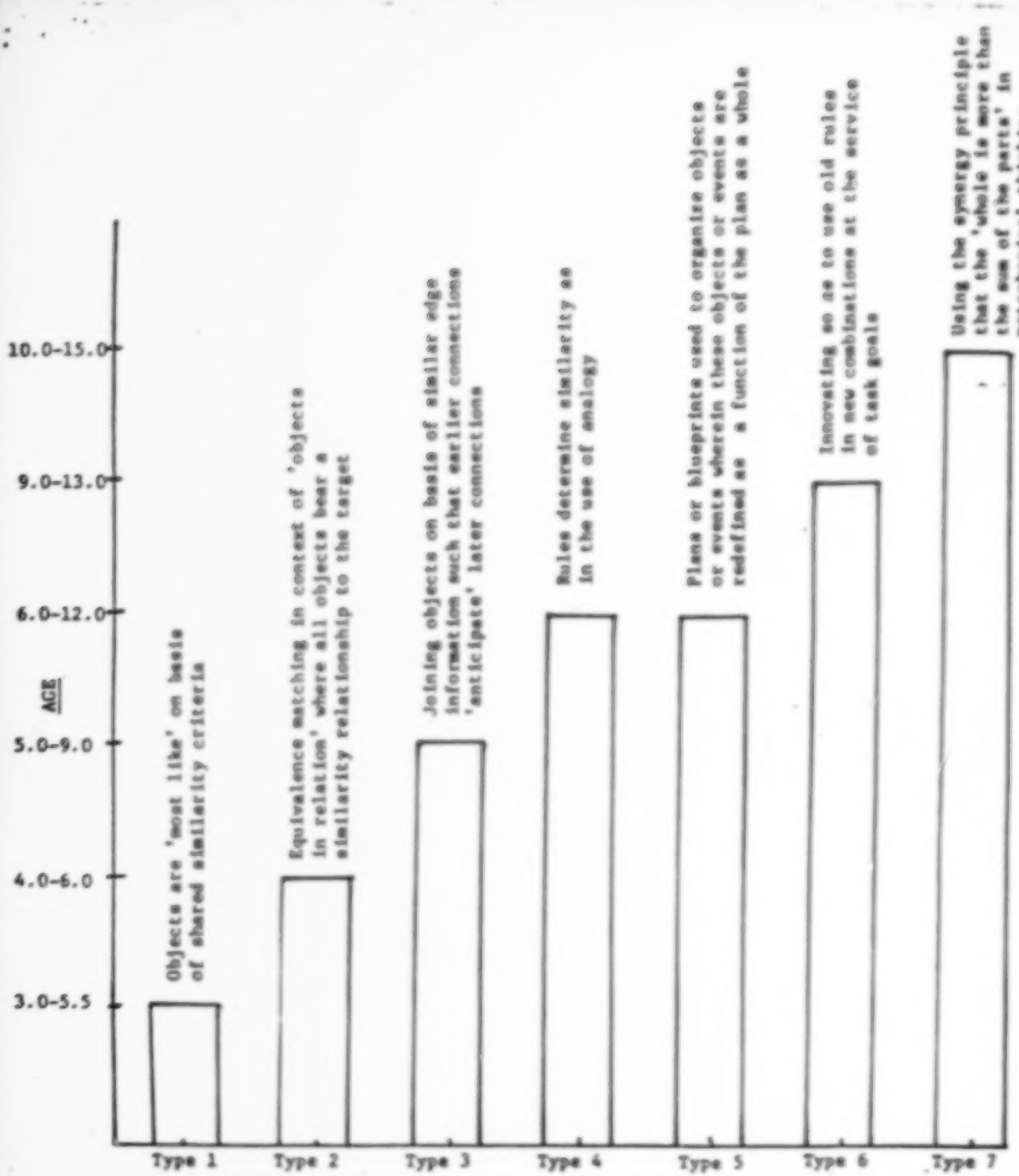
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Objects are 'most like' on basis of shared similarity criteria
Equivalence matching in context of 'objects in relation' where all objects bear a similarity relationship to the target
Joining objects on basis of similar edge information such that earlier connections 'anticipate' later connections
Rules determine similarity as in the use of analogy
Plans or blueprints used to organize objects or events wherein these objects or events are redefined as a function of the plan as a whole
Innovating so as to use old rules in new combinations at the service of task goals
Using the synergy principle that the 'whole is more than the sum of the parts' in metaphorical thinking
Type 1
Type 2
Type 3
Type 4
Type 5
Type 6
Type 7

FIGURE 1

SIMILARITIES MODEL

PART-WHOLE THINKING

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Mann-Whitney on Percent Scores of Ravens Coloured Progressive Matrices Test as a Function of Cultural Background (N=90)

	Median Scores on Ravens	Mann-Whitney U	p value
Canadian	58.0	2220.0	0.1651
Canadian-Creek	50.0		

Table

Mann Whitney U Test on Scores on the Metaphoric Triads Task as a Function of Cultural Background (N=60)

	Median	Mann Whitney U	p value
Pairs of Correct Recognition		916.0	0.9941
Canadian	6.5		
Canadian-Creek	6.5		
Pairs of Metaphorical Explanation			
Canadian	6.0	1003.5	0.1932
Canadian-Creek	4.5		

Mann-Whitney U Test on Scores on the Proverbs Test as a Function of Cultural Background (N=60)

	Median	Mann Whitney U	p value
Correctness			
Canadian	39.0	994.5	0.2428
Canadian-Creek	36.5		
Correct Abstract			
Canadian	16.0	877.5	0.5844
Canadian-Creek	18.5		
Correct Abstract Preference			
Canadian	5.0	763.5	0.0256
Canadian-Creek	9.5		
Correct Literal			
Canadian	27.0	1036.5	0.0736
Canadian-Creek	21.0		
Correct Literal Preference			
Canadian	17.5	1129.0	0.0016
Canadian-Creek	9.0		